



PURNABRAHMA

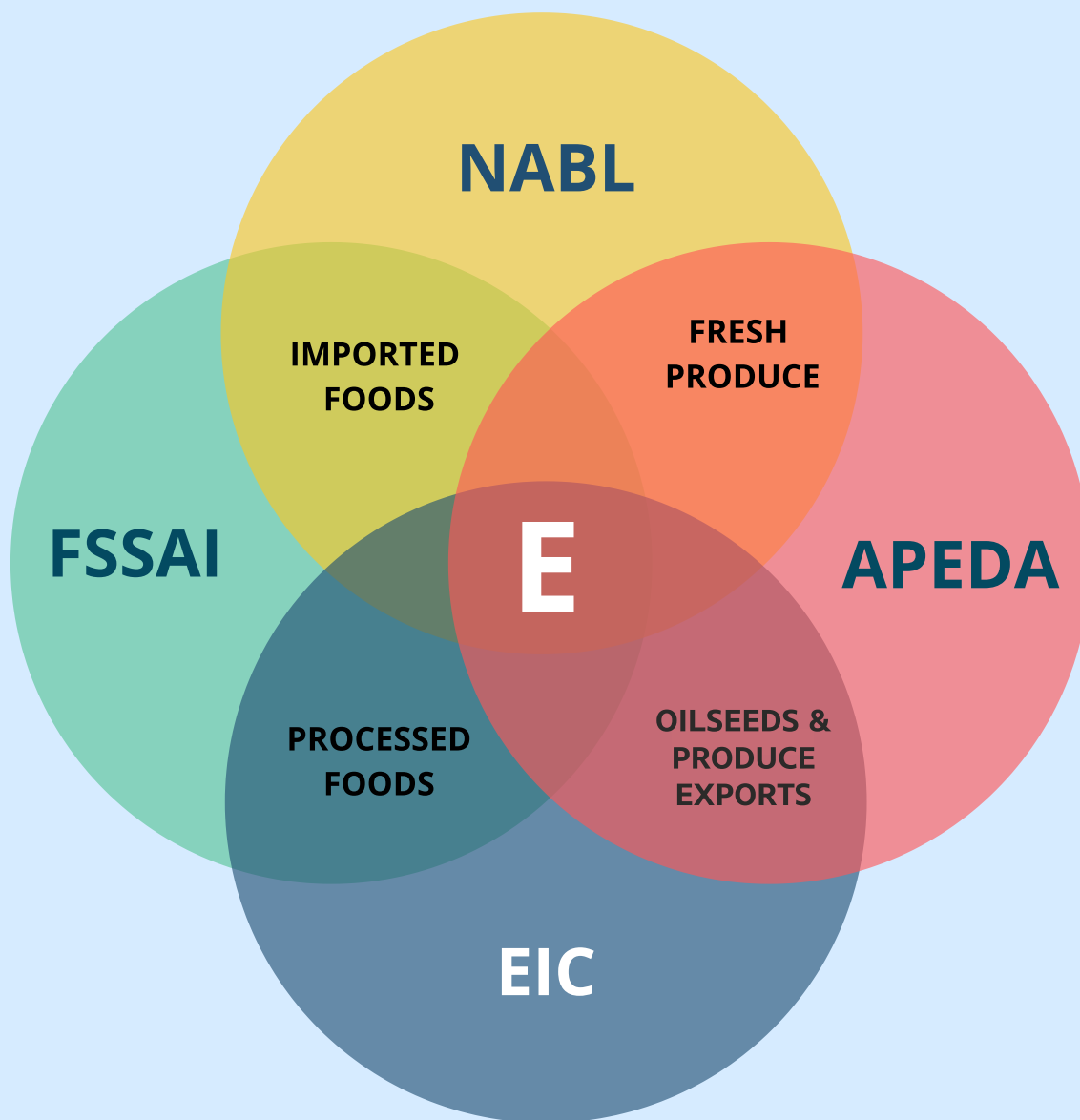
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GRAINS & PULSES



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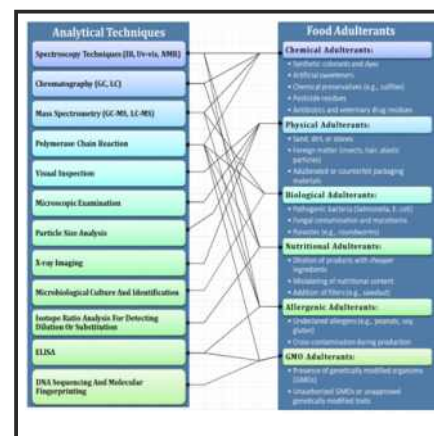
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Ms. Anjali Lokare
Food Consultant (Pune)
Farm to Fork Solutions



CASMB ACTIVITIES



MoU Signing with Prof. RMC College, Pune.

07 April 2023



Nilesh Lele, President Chamber for Advancement of Small & Medium Businesses (CASMB) along with honorable Soumya Swaminathan of World Health Organization during the program at Institute Of Chemical Technology. **18 April 2023**



Umesh Kamble with Shri. Rohit Kumar Singh, IAS Secretary, Department of Consumer Affairs, Govt of India was the Chief Guest for the event. **18 April 2023**



Chamber for Advancement of Small & Medium Businesses at Consulate General of Republic of Indonesia. **18 April 2023**



CASMB Visited to "Royal Thai Consulate General Mumbai". **27 April 2023**



Inauguration of Contract Manufacturing & Private Labelling (CMPL) Expo 2023 by Hon. Shri. Uday Samant. **04 May 2023**



Inter Food tech Expo 07-09 June 2023, Mumbai exhibition Center-Mumbai.



Panel Discussion on Industry 4.0 & AI for the Food Processing Industry. **09 May 2023**



CASMB ACTIVITIES



CASMB as a supporting partner at USA Blueberry Processing Seminar: Trends, Innovation & Opportunities Jio World TradeCentre, Mumbai. **13 June 2023**



CASMB's Secretary General Dr Umesh Kamble at National Legislators Conference Bharat (NLC Bharat). **15 - 17 June 2023**



CASMB in collaboration with CSIR- CFTRI organised a session on "Investment pitch on Food Processing" under the "One week one Lab" celebration at CFTRI Mysore. **03 July 2023**



Pune Millets Mela . **12 July 2023**



Smt. Anita Praveen-IAS Secretary MOPFI Govt India was the Chief Guest of the event. CASMB was the main partner of the IPR Workshop held at Pune, organised by NRDC. **14 July 2023**



MoU Signed Between Chamber for Advancement of Small & Medium Businesses (CASMB) & SNDT College of Home Science,Pune. **14 July 2023**



(CASMB) is an Exclusive Associated Partner of Koelnmesse India for Anufood India ANUTEC International FoodTec India PackEx India 2023 edition.



Chamber for Advancement of Small & Medium Businesses (CASMB) visit along with US Consulate General Mumbai Representative at ITCFSAN

USA blueberries

Nutrition Facts

What do you get in every boost of blue?

Fiber, vitamin C, vitamin K, manganese –
all at just 80 calories per cup. Fresh Blueberries
are also low in sodium and have virtually no fat.

It's a simple, no-stress food you can enjoy
any time of day and anywhere.



Energy Balls



Ice-Cream



Patisseries



Cereals



Bakery Products



Blueberry Snack

**Frozen
Blueberries**

**Dried
Blueberries**

**Canned
Blueberries**

**Blueberry
Powder**

Puree



Scan to know more:

U.S. Highbush Blueberry Council

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Dr. Prabodh Halde

**Chairman
Chamber for Advancement
of Small and Medium
Businesses, CASMB**



Dear Readers

As the Chairman of the Chamber, I am delighted to share with you the latest edition of our magazine, Purnabrahma, with a special focus on the theme of "Grain and Pulses." In this issue, we aim to highlight the significance of grains and pulses in the context of India's food and agricultural landscape.

India, with its vast population, has a pressing need for increased protein and fiber intake. Grains, especially coarse grains, play a vital role in providing essential dietary fibres and minerals. Pulses and millets not only offer nutritional benefits to individuals but also contribute to the sustainability of our planet by improving soil conditions and requiring less water compared to other crops.

In the realm of nutrition and sustainability, millets have gained significant importance, and the world is currently celebrating the International Year of Millets in 2023. Millets are a diverse group of small-seeded grains that offer numerous benefits. They are rich in dietary fiber, vitamins, minerals, and antioxidants, making them an excellent source of nutrition. Millets are also gluten-free, making them suitable for individuals with gluten sensitivities. Moreover, millets have low water requirements and are resilient to climate change, making them environmentally friendly and sustainable crops. Additionally, pulses, which include lentils, beans, and peas, are a vital

component of a healthy diet. They are an excellent source of plant-based protein, dietary fiber, and essential minerals. Pulses contribute to improved soil health by fixing nitrogen, reducing the need for synthetic fertilizers. Their cultivation promotes sustainable farming practices and enhances food security. Embracing the consumption of millets and pulses can play a significant role in addressing nutritional needs, promoting sustainability, and ensuring a healthy future for our population.

The Green Revolution, which unfolded in the late 1970s, transformed the Indian agricultural industry, making the country self-sufficient in food production. Having achieved food security, it is now time to focus on attaining nutritional security. Millets and pulses can undoubtedly play a crucial role in this endeavour.

I am pleased to witness the remarkable work of our CASMB team in supporting industries, particularly small and medium businesses, and the student community. Their efforts have contributed to the growth and development of the sector, fostering innovation and entrepreneurship.

On behalf of the Chamber, I extend my heartfelt congratulations to the entire editorial team for their dedication and hard work in bringing this magazine to life. I am confident that the articles and insights featured in this edition will enlighten and inspire our readers.

Wishing you all a fruitful and prosperous year ahead.

Regards

Dr. Prabodh Halde

**Chairman
Chamber for Advancement of Small and Medium
Businesses (CASMB)**



**CHAMBER FOR ADVANCEMENT
OF SMALL & MEDIUM BUSINESSES**

Nilesh Lele

**President,
Chamber for Advancement
of Small and Medium
Businesses (CASMB)**



Dear Esteemed Readers,

I am delighted to address you in this edition of our esteemed food industry magazine, dedicated to the fascinating world of Grain and Pulses. As we venture into the year 2023, it is evident that the grain and pulses sector in India is witnessing a transformative journey, shaped by dynamic trends and evolving consumer preferences.

India, renowned for its agricultural heritage, continues to be a global leader in the production and consumption of grains and pulses. In recent years, there has been a remarkable surge in demand for these essential commodities, driven by factors such as an expanding population, increasing urbanization, and a growing awareness of the nutritional benefits they offer.

One of the most notable trends in the Indian grain and pulses industry is the rising popularity of sustainable and organic practices. Consumers are now more conscious of the environmental impact of their food choices, prompting a shift towards eco-friendly and ethically sourced products. Farmers, too, are embracing innovative techniques that promote biodiversity, reduce water consumption, and foster a healthier ecosystem.

Another significant aspect shaping the landscape is the integration of technology in agriculture. With the advent of digital solutions and smart farming techniques, Indian farmers are enhancing productivity

and optimizing resource utilization. From precision farming to IoT-based monitoring, technology is revolutionizing the way grains and pulses are grown, harvested, and processed.

Furthermore, the diverse range of value-added grain and pulse products has garnered tremendous attention in the market. From gluten-free flours and fortified grain blends to innovative ready-to-cook pulse-based meals, manufacturers are continuously exploring new avenues to meet the evolving consumer demands for convenience, taste, and health.

However, as we navigate these promising trends, it is vital to address the challenges posed by climate change and fluctuating market dynamics. Climate variability can significantly impact crop yields, emphasizing the need for resilient and adaptable agricultural practices. Additionally, the industry must maintain an equitable and sustainable supply chain, ensuring fair compensation to farmers and stable prices for consumers.

In conclusion, the Grain and Pulses industry in India stands at a pivotal juncture, poised for remarkable growth and positive transformation. By embracing sustainability, innovation, and inclusivity, we can unlock the vast potential of this sector and contribute to the well-being of our nation.

I extend my heartfelt appreciation to all the stakeholders in the food industry who work tirelessly to ensure that the grains and pulses we consume are of the highest quality. Together, let us forge ahead and build a future where nutritious and wholesome food is accessible to all.

Wishing you a prosperous and fruitful reading experience.

Sincerely,

Nilesh Lele

**President,
Chamber for Advancement of Small and Medium
Businesses (CASMB)**



PURNABRAHMA

Dr. Rahuul Marwah

MD Ayurveda, DYA, CCKS
Chief Editor,
Purnabrahma



Ask an old person, on what is the main constituent of Traditional Indian food? The answer will be very flat.. Pules and Grains. Since ages, Indian food has been predominantly full of different grains and pulses, cooked in various different ways as per season and festivals. What is more interesting is that we hold them as sacred as God because they nourish our body and soul. Today, with the market booming with imported food products into India, the truth is, there is no real satisfaction unless you consume pulses and grains together in your diet.

Our traditions have always taught us to worship food right from the time seeds were sown, to the harvest, while cooking it and also just before consuming it. When such things are consumed in a right way, they nourish our body, mind and

soul. Therefore it's known as Purnabhramha. Just as our quarterly magazine Purnabhramha, which places our gratitude to all the writers for providing with such insightful articles. Gratitude to all the readers for showing their love and affection. Gratitude to those placing their advertisement, for they have shown care for bringing forward the needful things to the readers.

This edition of Purnabhram will definitely give you insights on different aspects of pulses and grains including the technological, nutritional and medicinal aspect. Along with that inspiration story from ex Lok Sabha Speaker Mrs. Sumitra Mahajan ji, will lead your life in a new direction of understanding. With so much of aspects being covered, I wish all the readers body, mind and soul are satisfied with all the information.

Regards,



Dr. Rahuul Marwah
MD Ayurveda, DYA, CCKS
Chief Editor, Purnabrahma



PURNABRAHMA

Dr. Ritika Joshi

Sub-Editor
Purnabrahma



Hello Readers.

We welcome you to another issue of this year!

In this issue we talk about the well-known components of our daily diet but only a few of us actually know its nutritional relevance. We are talking about cereals, grains and pulses.

A wholegrain is a grain of any cereal and pseudocereal which are rich source of carbohydrates, protein, micronutrients and dietary fiber. Whereas a pulse is an edible seed of a dry grain obtained from group of plant family called legumes. Millets or “Super Food” or “Nutri-Cereals” are more popularly referred to as “Shree Anna”, interpreted as the “best among grains”, are entitled to as “the door to prosperity” for India’s farmers, “the cornerstone of nutrition” and as

“prospective ally” against climate change.

With this issue we explicate the importance of different nutrients present in grains, millets and pulses and how their consumption is of significant importance and a must in our daily diet. With public’s inclination towards a veganism or vegan diet, this issue highlights different plant-based milks available and their nutritional attributes. This issue also features articles on the potential food frauds which the consumer must be aware of along with analytical techniques that can be instrumental in detecting food adulterants.

It is the time we feel the pulse of pulses and goodness of grains with mindfulness so that a good interplay between the nutritional adequacy, reduction of chronic diseases and environmental sustainability is maintained.

Happy reading....!!

Thank you !

Dr. Ritika Joshi
Sub-Editor
Purnabrahma

From Chiplun to Loksabha Speaker PadmaBhushan Mrs. Sumitra Mahajan



Mrs. Sumitra Mahajan is a well-known Indian politician who served as the Speaker of Lok Sabha, the lower house of the Indian Parliament, from 2014 to 2019. She was born in *Chitpavan Brahmin* marathi family to Usha and Purushottam Sathe in Chiplun, Maharashtra. After marrying Jayant Mahajan of Indore, she pursued M.A.(Psychology) and LLB from Indore University (now Devi Ahilya Vishwavidyalaya, Indore).

She belongs to Bharatiya Janata Party (BJP) and had represented the Indore constituency of Madhya Pradesh from 1989 to 2019 as the longest serving woman member of the Parliament. She was awarded India's third highest civilian award the PadmaBhushan in 2021. She also served for as a Union Minister of State from 1999 to 2004, holding the portfolios for Human Resource Development, Communications and Information Technology and Petroleum and Natural Gas.

She has also held position of Chairperson of Standing Committee on Social Justice and Empowerment (2004-2009) and Standing Committee on Rural

Development (2009-2014). She was the eldest and seniormost among woman members of the Parliament in the 16th Lok Sabha. She is the second woman after Smt. Meira Kumar to be elected as the Speaker of the Lok Sabha. CASMB Advisor, Dr. Prakash Kondekar, especially, visited her residence in Indore recently and spoke with her.

Dr. PK: Can you tell us something about your family background and education and hobbies?

SM: I come from Sathe family in Chiplun. My primary education was in Chiplun. My further education was after my marriage, in 1965, after marrying Jayantrao Mahajan of Indore. My hobbies include reading, music, drama and cinema as well as an enthusiasm for singing. My inspiration is the 18th century queen Ahilyabai Holkar throughout my life. I have also written a book on Ahilyabai Holkar's life journey '*Matoshree*' which was unveiled by Prime Minister Narendra Modi in 2017.

Dr. PK: How was your inspirational political journey so far?

SM: My political career started as a Corporator, Municipal Corporation, Indore (M.P.) (1982-85). Thereafter, Deputy Mayor, Municipal Corporation, Indore and Member of Parliament,

JUL. 2002 - MAY 2003: Union Minister of State, Ministry of Communications & Information Technology

24 MAY 2003- MAY 2004: Union Minister of State, Ministry of Petroleum and Natural Gas.

1998: General-Secretary, B.J.P.

1998-99: Member, Standing Committee on Human Resource Development and its Sub-Committee on Value-based Education Convener, Sub-Committee on Drug Control, Standing Committee on Human Resource Development Member, Committee on Empowerment of Women Member, Committee on Members of Parliament Local Area Development Scheme (MPLADS) Member, Consultative Committee, Ministry of Human Resource Development

1999: Re-elected to 13th Lok Sabha (5th term)

OCT. 1999- JUN. 2002: Union Minister of State, Ministry of Human Resource Development

JUL. 2002 - MAY 2003: Union Minister of State, Ministry of Communications & Information Technology

24 MAY 2003- MAY 2004: Union Minister of State, Ministry of Petroleum and Natural Gas.

2004: Re-elected to 14th Lok Sabha (6th term)

2004-2009: Member, General Purposes Committee Chairperson, Standing Committee on Social Justice and Empowerment Member, Panel of Chairpersons (Lok Sabha) Member, Consultative Committee, Ministry of Civil Aviation.

6 JUN. 2014: Unanimously elected as Speaker, 16th Lok Sabha

OCT. 1999- JUN. 2002: Union Minister of State, Ministry of Human Resource Development

POSITION HELD AS SPEAKER

Chairperson, (i) Business Advisory Committee (ii) Rules Committee (iii) Joint Parliamentary Committee on Maintenance of Heritage Character and Development of Parliament House Complex (iv) Committee on Installation of Portraits/Statues of

National Leaders and Parliamentarians in Parliament House Complex (v) General Purposes Committee (vi) Committee on Security in Parliament House Complex (vii) Standing Committee of All India Presiding Officers' Conference (viii) Executive Committee of CPA India Region President, (ix) Indian Parliamentary Group and (x) India Branch of the Commonwealth Parliamentary Association (CPA).

Dr. PK: What are current activities at this age of 80?

SM: I am not in active politics now but whatever roles party gives me I give justice to it.

Dr. PK: Can you tell us about a few experiences which were stressful?

SM: Yes, Congress-led opposition parties continued to stall the proceedings of Parliament, inviting the ire of me as a Lok Sabha Speaker. I had suspended at least 25 opposition MPs for five days.

Dr. PK: How could you balance your family life and political life?

SM: It is really a difficult task but one has to tackle it carefully.

Dr. PK: What message would you like to give to the youngsters?

SM: Message 1:

“उद्यमेन हि सिध्यन्ति कार्याणि न मनोरथैः ।
न हि सुप्तस्य सिंहस्य प्रविशन्ति मुखे मृगाः ।”

Meaning: जिस प्रकार सोते हुए सिंह के मुँह में मृग स्वयं नहीं प्रवेश करता, उसी प्रकार केवल इच्छा करने से सफलता प्राप्त नहीं होती है । अपने कार्यको सिद्ध करने के लिए मेहनत करनी पड़ती है ।

Have you ever heard of a deer coming and entering the mouth of a lion while it sleeps? In that case, why are we led to believe that we can achieve success by merely thinking about it or coveting it? One can achieve success only by working hard and through dedication.

Message 2:

"With a smile on your face, share your excess business profit with those in need." ■

Acceptance, Inclusion & Empowerment: Mantra for a disability friendly society

Dr. Pratima N. Shastri, Dr. Prakash Kondekar, Swapnil Muley



Apanga Mahila Bal Vikas Sanstha is a social organisation, established in 1993, by **Late Shrimati Usha Sant**, who was a faculty at *Matru Sewa Sangh College of Social Work, Nagpur*. She was deeply involved in rehabilitation of disabled persons, to bring them in mainstream of the society with a three way approach of “Acceptance, Inclusion and Empowerment”. This is achieved by extending need based support on academic, social and emotional fronts. Apart from disability, malnutrition amongst women and children is also an obstacle in their proper growth and development, and the society as a whole. WHO has indicated that malnutrition in adolescent girls is reflected in poor maternal and child health in subsequent generations, and emphasizes a need for health and nutrition awareness in the society. The team consisting of members with expertise in the field of education, medicine, and nutrition, along with enthusiastic volunteers is committed to address these issues through multi disciplinary project “**Ashadeep**”.

Presently, Dr. Pratima Shastri (Daughter of Late Mrs. Usha Sant) coordinates these activities as the President, Apanga Mahila Bal Vikas Sanstha, Nagpur. She is a strong academician, former Professor and Head, Dept. of Food Technology, Laxminarayan Institute of Technology, R.T.M. Nagpur University, Nagpur, with 35 years of experience in teaching Food Technology.

Along with regular teaching and research, she is also involved in creating awareness about nutrition, promoting traditional nutri foods and enhancement of their nutritive value, development of premixes for convenience of modern consumer. Her second innings

started in 2008 when she decided to devote her time for Apanga Mahila Bal Vikas Sanstha activities and initiated several innovative ideas for encouraging and motivating especially abled children and youth. Recently one patent on “Dehydrated grain based fermented probiotic mix” has been awarded to her.

CASMB's Advisor Dr. Prakash Kondekar, visited Dr. Pratima Shastri in Nagpur recently and spoke to her about her career and vision.

Dr. PK: Tell me something about your family background and education.

Dr. PNS: My father, Late Dr. V.P. Sant was a civil surgeon, in Madhya Pradesh. On account of his frequent transfers, I did my schooling from different places in Madhya Pradesh. I passed B.Sc. from renowned, Holkar Science college, Indore, with Chemistry, Botany and Zoology group. I was equally interested in chemistry and biology and hence, decided to join Post Graduate Department of Biochemistry at Nagpur University for M.Sc. (Biochemistry). I completed M.Sc. in 1968, topping the merit list and was the recipient of Sunderlal Sahu Gold Medal. After about 3 years of teaching at Veterinary College, Mhow, Madhya Pradesh, I shifted to Nagpur due to my marriage with Dr. Narayan Shastri, who was a faculty at Post Graduate Department of Biochemistry, Nagpur University.

Dr. PK: What was the motivation to join teaching profession and what was your specialisation.

Dr. PNS: I was always interested to go for higher studies and research. While I was planning to join Ph.D. with a fellowship, in 1971, an unexpected opportunity came my way. Laxminarayan Institute of Technology

(Nagpur University) started new branch -Food Technology-at B.Sc. Tech. level and there was an immediate need for faculty to teach Food Biochemistry and Microbiology. I joined the institute on 12th December 1971, as temporary lecturer and that was the beginning of my 37 years of association with this prestigious institute. Although the course contents were chalked out beforehand, I was involved in setting up of laboratory from scratch, planning of experiments and teaching biology to hard core technology students. Allotment and supervision of undergraduate and postgraduate research projects while working within available limited facilities was challenging and fascinating. Simultaneously with the teaching assignments, I also started research for my Ph.D. and was awarded degree in 1984 in Microbial Biochemistry. I was also teaching Food science and Nutrition in Post graduate Dept. of Home Science as contributory faculty. Research supervision included students belonging to different backgrounds e.g. Biochemistry, Microbiology, Food and Nutrition and Chemical Technology, with 15 Ph.D., 4 M.Phil. and large number of M.Tech., M.Sc. (IGNOU) and undergraduate students.

My own Ph.D. research was related to microbial biochemistry. The research was further extended to studies on microbial enzymes production by solid state fermentation using agro waste & application of statistical optimisation techniques, such as response surface methodology (RSM) and Artificial Neural Network (ANN), for optimisation of enzyme production, which reduced the number of experiments required to be done in multi variable system.

Food Technology is an interdisciplinary subject that relates the traditional food processing to the modern science and technology. I realised that my first-hand experience in kitchen, as a home maker, could be a starting point to explore the science in culinary art. I also realised that research is not just working in a laboratory with a white apron and sophisticated equipment's, surrounded by glassware and chemicals but is combination of curiosity for simple phenomenon around you and out of the box thinking capacity. **I developed special interest in structural and nutritional changes during traditional processing of grains, such as puffing, flaking, dry roasting and malting, as well as in the development of low cost nutritious food supplements and premixes for traditional laborious time consuming recipes. This interest still continues through Ashadeep Health and Nutrition centre, which has a small trial kitchen with basic facilities that are extended to M.Sc. and M.Tech. (Food Science and Technology) students**

and also to prospective entrepreneurs.

PK: How did you get associated with NGO and what are current activities of this organisation?

Dr. PNS: I was associated as a member and as expert for Nutrition centre activities right from 1993. However, my active participation started immediately after my superannuation and I became the President of the organisation since 2015. Since then various activities were carried out and there are two major areas under project "Ashadeep".

(A) 'ASHADEEP' Divyanga Punarwasan and Prerana Kendra (Centre for rehabilitation and motivation of specially abled) Apart from providing devices like wheelchairs and prosthesis, providing support regarding education and supporting entrepreneurship for ortho-disabled, the scope was expanded to cover educational needs of visually impaired. Academic journey for blind is an obstacle race. The study material needs to be converted in audio format, and during examination, help of a scribe or writer is essential to express this on the answer paper. This was the time for rapid developments in communication technology through handy recording devices and android phone, which could replace the clumsy tape recorder as an educational support. Our members enthusiastically learned the technology of audio recording and soon a support group was formed to prepare the audio book library for visually impaired students and students who had to send the books to Mumbai and Pune for recording.

We have also initiated a writers' club that arranged support scribes to visually impaired students. Special coaching for various competitive examinations including banking was arranged. During the recent pandemic, several online activities, motivational lectures and competitions were arranged, with the objective to remain in touch with the students and boost their spirits. Motivating journey of Nagpur based divyanga achievers were depicted through a series of videos in "Nagpur Divyabhushan 2020 project". These videos can be watched on youtube channel "**ashadeep sanstha**". Promotion of outdoor and indoor sports is encouraged through special inclusive sport events like women's cricket, and chess competition where blind players get the opportunity to play against sighted players and project their abilities against the disabilities.

Support for skill development and entrepreneurship is also extended for self-reliance.

(B) 'Ashadeep' Health and Nutrition centre

Health and nutrition centre conducts awareness

programs about importance of nutrition for various groups like adolescents (Diet-An investment), house makers (*Annapoorne che Kanmantra*), senior citizens (Fifty not out: Be on watch out) and through talk shows and lectures. Special emphasis is being given to create awareness about junk food amongst college students (How junk is your food?). Educational videos are prepared and promoted through youtube channel "ashadeep sanstha". Special sessions for adolescence health education are held in special schools with the help of Braille books and tactile 3D models.

Nutri food production centre works around the theme 'THINK GLOBAL-EAT LOCAL'. Activities include formulating nutritious foods, based on local produce, familiar to local food culture, with simple processing, and without chemical additives. Emphasis is on multigrain combinations, to optimise nutrition value. The list of products includes whole wheat and millet based multigrain cookies, multipurpose multigrain flours, ready to cook (RTC) premixes for healthy traditional recipes, special protein supplements for convalescence, adolescence and special needs like pregnancy and lactation. Training programs and consultation services are extended for prospective entrepreneurs.

Some success stories

Chanda Kale, a childhood polio victim, was supported to learn preparation of papier mache dolls. Now she prepares various beautiful dolls, and has created income generation opportunities for needy women, by training them in this area.

Blind Ajay Kalse, a trained massage therapist, has trained a group of visually impaired people with support from Ashadeep centre. They are now practising independently.

Akshay Chaudhari is member of National Blind Cricket team and has represented India in international level. He is now employed in a Bank.

Suvarna Raj (Wankhede) is an international para athlete and is the recipient of the Presidents Rashtriya Divyangjan puraskar.

The credit of the success certainly goes to their own hard work and perseverance, but timely support and encouragement from 'Ashadeep' has definitely facilitated their journey.

Some important projects

- Diet based approach for alleviating anaemia in adolescent girls (2015)
- Educational tour for visually impaired students

(2018, 2020, 2023)

- Inclusive ladies cricket match amongst visually impaired and sighted players (2018)
- Paper bags preparation workshop for tribal women in Livelihood generation program of Dept. of government forest department (2019)
- Inclusive chess event for visually impaired and sighted players (2022)
- Massage therapy training for visually impaired (2022)

Dr. PK: How do you view your journey so far and ahead?

Dr. PNS: Journey so far has been enjoyable, with right support at right time from family, professional colleagues and present team of motivated and empathetic friends, extending selfless service for all projects of 'Ashadeep'.

Best part of the teaching career is opportunity to interact with students, and trying to offer as much as possible, not just subject knowledge, but professional competence. It is a matter of pride to watch my students as prominent consultants, academicians, and entrepreneurs in food processing sector, and getting a comment from somebody "Oh, you are his/her teacher"!

My present activity is an opportunity to give back to the society, by way of extending necessary support to the individuals who are motivated to move ahead, in spite of challenges of disabilities. At times, I think it is their positivity, that keeps my spirits high, and satisfied.

Awards:

Tejaswini award by Swatantryaveer Sawarkar Smruti Pratishtan, Nagpur (2018)

Lokamata Sumatibai Sukalika award by Sumatibai Sukalika Pratishthan, Nagpur (2021)

Special recognition award by IMA (Nagpur) (2022)

Dr. Kusumtai Wankar award by Abhivyakti, Nagpur (2023)

Books published:

आरोग्य आहार आजार - डॉ . प्रभा बल्लाळ व डॉ. प्रतिमा शास्त्री

Multigrains -A Road to wellness - E publication for free circulation

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Grains & Pulses - A Vegetarian Power House in Diet

Dr. Smita Lele
Advisor, CASMB



At the outset, I am very happy to see *Purnabrahma* Magazine growing so well and taking up important and relevant themes. One of the earlier issues on *Millets* has come out very well and was the most apt topic to celebrate the International Year of Millets. This issue of *Purnabrahma* is dedicated to Grains and Pulses. Anywhere in India, if one wants a simple, staple, affordable and easy to cook meal – the option is *Dal-*

Rice!!! It could be “*Varan Bhaat*” in Maharashtra or “*Sambar-Rice*” in South India or “*Dal-Khichadi*” in Gujarat. Even for a baby, typically after few months, milk is replaced by one meal using clear soup of pulses with little cooked grain. Typically, *Tur* or *Moong* dal extract is used with a spoon full of rice or sometimes Ragi. Modern nutrition recommends combination of grains and pulses in order to get complete balance of essential amino acids. *Dal-Chawal* is one such best example. That is why Ayurveda states that grains and pulses are vegetarian power house in diet. Grains provide carbohydrate which is the basic fuel for the human body to function and pulses add proteins to the diet – another essential component for building muscles, tissue and strengthening the body. For children above age 1 and adults, *Dal-Chawal* is always consumed with some pure *ghee* – the third essential component of diet – fat. Especially *desighee* has many health benefits in addition to just energy, lubrication and vitamin source.

Dear readers and potential entrepreneurs, this is the time to contribute in “*Make in India*” movement by using traditional wisdom and making good food products which are marketable. FSSAI has already included Ayurvedic *Aahaar* as a category – now it is the time to convert knowledge into wealth – Good Luck! ■

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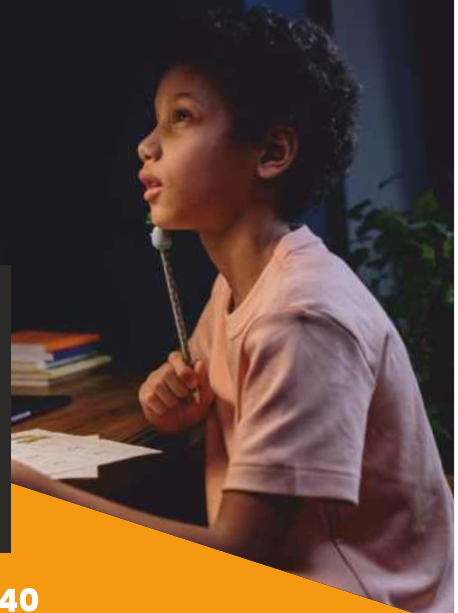
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Unleashing the benefits of pulses in your diet: Powering up your health

Ms. Srirupa Guha

Senior Nutritionist,
Hyugalife



India is famous for its multicultural and multi-cuisine identity. Here people belonging to various cultural and religious backgrounds live together which gives birth to various types of extravagant cuisines. India is a land of culinary diversity, but few ingredients and food groups remain constant across all culinary practices. Pulses are one such food group that is consistent and used vividly across all culinary practices through generations. Pulses or legumes are very much integral



part of not only Indian diet, but also Pakistan and other South East Asian countries, Mediterranean region and other continents as well. Let us dive deep

and explore what pulses are, who should consume them and unlock potential benefits of these pulses.

Let's find out what are pulses? Pulses are known as grain legume and is part of legume family, but the term "pulse" refers only to the dried seed. It includes dry beans, dry peas, chickpeas, and lentils. They are high in protein, fibre, and many vitamins, provide amino acids, and are hearty crops. Pulse crops are one of the most sustainable crops a farmer can grow. They also contribute to soil quality by fixing nitrogen in the soil.

Who should consume pulses? Pulses are a great source of protein and fibre. Along with that it is a source of complex carbohydrate and healthy fats and other essential phytonutrients. Substituting some portions of non-vegetarian protein especially meat with pulses is a great way to eat less unhealthy saturated fat, managing weight and keeping digestive system healthy. Thus, people from all age group and ethnicity can have dal or pulses except in certain conditions. The anti-nutritional factors of dal might cause digestive distress to some, while others might have to limit certain dals as in case of hypothyroidism and gout or overall protein intake due to health condition like renal issue or others. People who are opting veganism or are gluten-intolerant, can consume pulses at ease.

Now, let's deep dive into some potential health benefits of pulses.

- (1) **Heart health:** One of the prime health benefits of pulses is that it helps to keep heart health in good condition. Individuals who add pulses to their diet have reduced the chances of cardiovascular diseases. Further, pulses contain a high level of potassium and a low amount of sodium which aids in keeping blood pressure levels in check.
- (2) **Keeps diabetes at bay:** Pulses and legumes rank lowest in glycaemic index. This indicates pulses lead to a nominal rise in blood sugar levels when consumed.
- (3) **For better gut-health:** Pulses including dry beans, lentils, chickpeas and dry peas, have the highest proportion of fibre and are inexpensive, easily accessible, and have longer shelf-life. The inclusion of pulses in regular meal is an easy option for obtaining daily fibre requirement and maintaining a healthier gut and overall health. Dietary pulses-derived resistant starch is a relatively less explored prebiotic ingredient.
- (4) **Rich Source of Nourishment:** Pulses are a rich source of fibres, protein, antioxidants, and complex

carbohydrates. These food items are packed with minerals such as calcium, potassium, magnesium, iron and vitamin B, niacin, thiamine, folic acid. (5) *Rich Source of Folic acid and Iron*: Pulses are rich in folate as they contain vitamin B9 as well as iron and helps in DNA replication. Thus it should be present in the diet of expectant mother, infants and growing children. (6) *Enriched With Plant-based Protein*: Pulses contain a high level of amino acids, making them a superior source of protein. Vegans or vegetarians can derive their daily essential portion of protein from pulses and legumes. (7) *Reduces risk of Cancer*: Various studies suggests that pulses are packed with antioxidants, has anti-inflammatory and anti-carcinogenic property. Pulses are rich in selenium, which reduces the rate of tumour growth, making it suitable for cancer prevention.

Ways to enhance nutritional value of pulses:

Legumes are rich in micronutrients, but they also contain many anti-nutrients which need to be minimized to improve the bioavailability of

micronutrients. In such cases, **Biofortification** is the best technique to improve its nutritional content. *Biofortification is a key method by which the nutritional value of pulses and legumes can be increased with the help of breeding, transgenic techniques, or agronomic practices and thus helps in preventing the malnutrition.*

New product development with Pulses: Alternative protein is most sustainable option for vegan or vegetarian for deriving their protein requirement. The market is booming with plant-based, vegetarian and vegan options. Increasing numbers of consumers are adopting a 'flexitarian' or 'sustainable' approach to be a part of their daily life, prompting food industry to innovate more and more plant-based alternatives using pulses. Few examples are soymilk, soy-based nuggets or sausages or products that mimic animal product in terms of taste and texture. Thus, pulses play a very prominent role in our daily diet. Besides being nutrient-dense and versatile, it's sustainability and textural qualities are holding huge prospect for food industry to innovate many more pulse-based products. ■

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The Power of Grains and Pulses: A Nutritional Marvel

Ms. Akansha Laddha

Affiliation: M.Sc. in Nutrition and Dietetics, Certified Diabetes Educator, Certified Weight Loss Consultant, PN Certified Nutrition Coach



Introduction

Grains and pulses have been an integral part of human diets for centuries, providing sustenance, energy, and essential nutrients. From rice to lentils, these versatile food groups have gained popularity across cultures due to their incredible nutritional value and health benefits. In this article, we will explore the nutritional aspects of grains and pulses, shedding light on their remarkable contributions to a healthy and balanced diet.

1. Grains: Nature's Energy Storehouse

Grains are the edible seeds of plants belonging to the grass family. They come in various forms, including wheat, rice, oats, barley, and corn. Rich in carbohydrates, grains are an excellent source of energy, providing fuel for the body and brain. Moreover, they offer a range of essential nutrients such as dietary fiber, vitamins, and minerals.

- a) *Fiber-Rich Goodness:* Whole grains are particularly beneficial due to their high fiber content. Dietary fiber plays a vital role in maintaining digestive health, preventing constipation, and reducing the risk of certain diseases, including heart disease, type 2 diabetes, and colorectal cancer. According to a study published in the American Journal of Clinical Nutrition (2016), individuals consuming a diet high in whole grains had a

lower risk of developing cardiovascular diseases.

- b) *Essential Vitamins and Minerals:* Grains also serve as a rich source of essential vitamins and minerals, including B vitamins (such as thiamin, riboflavin, and niacin), iron, magnesium, and selenium. These nutrients play key roles in energy production, red blood cell formation, and maintaining a healthy immune system. A study published in the *Journal of the American College of Nutrition* (2017) emphasized the importance of incorporating whole grain foods to improve micronutrient status.

2. Pulses-The Protein Powerhouse:

Pulses, often referred to as legumes, encompass a wide range of dried seeds from plants in the legume family. Common examples include beans, lentils, chickpeas, and peas. Pulses are a remarkable source of plant-based protein, making them an excellent alternative to animal protein sources.

- a) *Plant-Based Protein:* Pulses provide an abundant supply of protein, essential for growth, repair, and maintenance of body tissues. Compared to animal protein sources, pulses are low in fat and cholesterol while being rich in fiber. Research published in the *Journal of the Academy of Nutrition and Dietetics* (2014) suggests that incorporating pulses into one's diet can have positive effects on the overall diet quality, weight management, and blood glucose control.
- b) *Heart-Healthy Nutrients:* In addition to protein, pulses offer a myriad of heart-healthy nutrients. They are rich in dietary fiber, which aids in lowering cholesterol levels and maintaining a healthy cardiovascular system. Pulses also contain potassium, magnesium, and folate, all of which contribute to heart health. A meta-analysis published in the *Canadian Medical Association Journal* (2014) demonstrated the positive impact of pulse consumption on reducing total cholesterol levels and lowering the risk of cardiovascular disease.

3. Essential Micronutrients:

Unveiling the power of vitamins and minerals in addition to carbohydrates, protein, and fiber, grains and pulses provide a diverse array of essential vitamins and minerals that are vital for overall health and well-being.

- a) *B Vitamins:* Grains and pulses are rich in various B vitamins, including thiamin (B1), riboflavin (B2), niacin (B3), pyridoxine (B6), and folate (B9). These vitamins play a crucial role in energy metabolism, promoting the conversion of food into usable energy. They are also involved in the functioning of the nervous system, production of red blood cells, and maintenance of healthy skin and eyes.
- b) *Iron:* Iron is essential for the formation of haemoglobin, the protein in red blood cells responsible for transporting oxygen throughout the body. Grains and pulses contribute to dietary iron intake, especially for individuals following vegetarian or vegan diets, as plant-based sources of iron are non-heme iron. Consuming these iron-rich foods alongside vitamin C-rich foods can enhance iron absorption.
- c) *Magnesium:* Both grains and pulses are excellent sources of magnesium, a mineral involved in over 300 enzymatic reactions in the body. Magnesium plays a crucial role in nerve function, muscle contraction, and the maintenance of strong bones. A study published in *Nutrients* (2018) suggests that increasing magnesium intake from whole grains and pulses may have a positive impact on bone mineral density and reduce the risk of osteoporosis.

4. Grains and Pulses in a Balanced Diet:

Incorporating grains and pulses into a balanced diet offers numerous health benefits and contributes to overall well-being. Here are some tips to maximize their nutritional impact:

- a) *Opt for Whole Grains:* Choose whole grains over refined grains whenever possible. Whole grains retain their bran, germ, and

endosperm, providing higher levels of fiber, vitamins, minerals, and antioxidants. Look for labels like "100% whole grain" or "whole wheat" to ensure you're making the right choice.

- b) *Diversify Your Pulses:* Experiment with a variety of pulses to enjoy their different flavours, textures, and nutrient profiles. Lentils, chickpeas, black beans, and kidney beans are just a few options to explore. Incorporate them into soups, salads, stews, and even baked goods for added protein and fiber.
- c) *Pair Grains and Pulses:* Combining grains and pulses in a meal creates a complementary protein source, as grains are low in the amino acid lysine, while pulses are rich in it. This combination provides a complete set of amino acids necessary for optimal protein synthesis.

Conclusion:

Grains and pulses are nutritional powerhouses that offer a wealth of health benefits. From providing sustainable energy to delivering essential nutrients, these dietary staples play a crucial role in maintaining a well-rounded and nourishing diet. Incorporating a diverse range of whole grains and pulses into meals can help reap their numerous benefits leading towards a healthier lifestyle.

References:

- Seal CJ *et al.* Whole grains, refined grains, and the carbohydrate-to-fiber ratio in relation to risk of cardiovascular disease and all-cause mortality. *Am. J. Clin. Nutr.* 2016; 104(1): 165-174.
- Ross AB *et al.* Whole-grain foods and chronic disease: evidence from epidemiological and intervention studies. *Proc. Nutr. Soc.* 2017; 76(4): 455-467.
- Mitchell DC *et al.* Consumption of dry beans, peas, and lentils could improve diet quality in the US population. *J. Am. Coll. Nutr.* 2014; 33(6): 478-490.
- Ha V *et al.* Effect of dietary pulse intake on established therapeutic lipid targets for cardiovascular risk reduction: a systematic review and meta-analysis of randomized controlled trials. *CMAJ.* 2014; 186(8): E252-E262.
- Volpe SL. Magnesium and the Athlete. *Nutrients.* 2018; 10(8): 946. ■

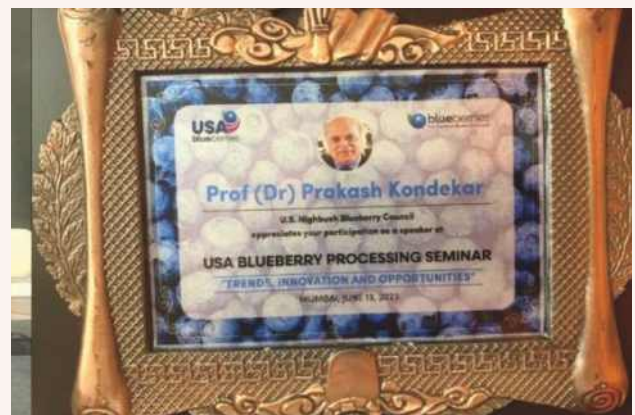


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A Concise Review on the Nutritional and Functional Properties of Sprouted Mung and Channa Pulses in Biscuit Production

Sonam Gupta



Guide:

Dr. Devender Kumar Bhatt

Institute of Food Technology, Bundelkhand University, Kanpur Road, 284128, Jhansi, UP

Introduction:

Sprouted pulses, such as *mung* beans (*Vigna radiata*) and *channa* (*Cicer arietinum*), have gained significant attention in the food industry due to their enhanced nutritional and functional properties. The utilization of sprouted *mung* and *channa* pulses in biscuit production offers a promising approach to enhance the nutritional value of baked goods. The primary objective of this article is to provide a comprehensive analysis of the utilization of sprouted *mung* and *channa* pulses in biscuit production, focusing on their nutritional benefits, functional properties, challenges, and opportunities.

Review of the Literature:

Sprouted pulses offer numerous nutritional benefits, including increased protein content, improved amino acid profile, higher levels of vitamins, minerals, and antioxidants. They are also rich in dietary fiber and exhibit enhanced bioavailability of nutrients. The functional properties of sprouted pulses, such as improved water absorption and binding capacity,

positively impact dough consistency and texture. Additionally, sprouted pulses demonstrate significant antioxidant activity and can influence the texture and sensory attributes of biscuits. Consumer perception and acceptance are crucial factors that need to be considered, and studies have shown that consumers have positive attitudes towards healthier and more nutritious food products.

Results and Discussion:

The nutritional analysis revealed that sprouted *mung* and *channa* biscuits had increased protein content, improved amino acid profile, higher dietary fiber, and enhanced levels of vitamins and minerals compared to traditional biscuits made with refined flour. The incorporation of sprouted pulses positively influenced the functional properties of the biscuits, including dough consistency, texture, volume, and fermentation. The sprouted biscuits also demonstrated significant antioxidant activity and exhibited a crisper and harder texture, which were well-received by consumers. Consumer acceptance studies indicated positive attitudes towards healthier food options, and marketing strategies emphasizing the nutritional advantages further enhanced acceptance and market potential.

Conclusion:

The utilization of sprouted *mung* and *channa* pulses in biscuit production offers a promising avenue to create healthier and more nutritious products. The sprouting process enhances the nutritional composition, functional properties, and antioxidant activity of the biscuits. Consumer acceptance of these sprouted pulse biscuits is positive, with a preference for the unique texture and perceived health benefits. Further research and development can focus on optimizing formulations, exploring new sprouted pulse combinations, and conducting sensory studies to ensure a balance between nutritional benefits and sensory appeal. The findings of this concise review support the growth of the sprouted pulse biscuit market, contributing to a more sustainable and nutritious food industry. ■



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Barley - A boon for diabetics

Dr. Pushkar Wagh

MD Ayurveda,
Dombivili



According to a data surveyed in 2019, there are 463 million diabetics in the world and the number is expected to reach 700 million by 2045 with a surge of around 51%. Slowly India has become capital of diabetes. Here, it is worthy to note that 87% of diabetes related deaths happen in poor or lower income group countries. Almost 90% of these patients have Type 2 diabetes caused by sedentary lifestyle and obesity. At the same time the type of food consumed also plays an important role in diabetes. Amongst the food choices, carbohydrate has been a key factor while dealing with diabetes. Main staples like rice, wheat and maize contribute to 80% of the energy intake. So if we can diversify food staples and it can offer a great help to the diabetic patients. This article will highlight the role of Barley (*Hordeum vulgare*) in the management of Type 2 diabetes as per Ayurveda and nutritional science.

Barley is one of the first cultivated cereals dating 10,000 years ago. Barley is world's fourth major cereal crop after rice, wheat and maize. But unlike rice, wheat and maize which are basically a part of our routine diet almost 70% barley is used as animal fodder and the remaining 30% is used as fermentable material for beer. Over the centuries it has very well adapted to different weather conditions. In temperate areas it is grown as a summer crop, while in tropical areas it is grown as a winter crop. It has short growing season and is also relatively drought tolerant. It is also mentioned in Rigveda (Oldest amongst all Vedas) as '**Yava**'. It was a main staple of Arya's back then. It used to be offered to the god during *Yagnya karma*.

Ayurveda has also mentioned barley in *Shukdhanya Varga* i.e., group of cereal and millets. In Ayurveda it is

called **Yava**. *Charaka Samhita*, *Sushruta Samhita* and *Ashtang Hridaya* are three important texts in Ayurveda. They are also called *Brihatrayi*. All these three books have stated properties of barley. According to Ayurveda, barley is of sweet and astringent taste. It has cooling effect on the body. It reduces *kapha* and *pitta dosha*. As it reduces *kapha dosha* it sheds extra fat from the body helping in weight loss at the same time it provides nourishment and strength as well. It curtails down excessive thirst. It increases stool quantity and produces more gas in large intestine but reduces urine output.

Ayurveda and diabetes:

Ayurveda has described a disease named *Prameh*. Excessive urination is the cardinal feature of *Prameh*. Thus it resembles diabetes in many ways. According to Ayurveda, elevated *kapha* is the root cause of *Prameh*. As seen previously barley is a potent *kapha* reducing food. Excessive thirst and frequent urination are quite bothersome symptoms for diabetics. Barley takes care of both issues. Regular consumption of barley helps in weight loss but as it gives ample nourishment so one doesn't feel tired. Because of slow peristalsis (sluggish movement of intestines) many diabetics complain about constipation. Owing to its rich fiber content barley acts as bulk forming agent for stools. It has also got protective effect on kidneys which is a great asset as renal failure is a known complication of diabetes.

Comparative nutritional information of barley, rice and wheat :

Cereal	Barley	Rice	Wheat
Energy (Kcal)	354	135	340
Carbohydrate (g)	73	78.2	64.7
Fiber (g)	17	0.28	1.2
Carb/Fiber ratio	4.3	278	53
Glycemic Index	28	68	62
Protein (g)	12.5	6.8	11.8

From the table it is evident that barley and wheat offer almost same amount of energy per 100 g. The carbohydrate content in all these cereals is also quite comparable. The major difference can be observed in the fiber content. 100 g of barley has 17 g of soluble and insoluble fiber on the contrary wheat and rice has merely 1.2 g and 0.28 g. The ratio of carbohydrate to

fiber is just 4.3 for barley but for wheat and rice its way too high 53 and 278 respectively. The fiber in barley doesn't allow sudden spike of glucose in blood. So barley is far better choice for diabetics than wheat and rice.

Glycemic index (GI) is a value assigned to foods based on how quickly and to what extent does it increase blood glucose levels. High GI of rice and wheat causes immediate surge of glucose in blood. On the contrary barley with GI of 28 is clear cut winner. In fact barley has got lowest GI amongst all the grains.

In one study 10 overweight women who ate barley or oats plus glucose. Both oats and barley decreased blood sugar and insulin levels. However barley was far more superior reducing levels by 59-65 % compared to 29-36 % with oats.

Beta glucan is a fiber present in barley which reduces bad cholesterol (LDL). According to a study conducted in 2008, consumption of 3 g of beta glucan per day reduces cholesterol level to 5-6%. Barley is a rich source of Vitamin B so it protects diabetics from diabetic neuropathy as well. So we can safely conclude that even nutritional science also validates

the utility of barley in diabetes as advocated by Ayurveda.

Farm to plate:

Barley is primarily available in two forms Hulled Barley and Pearled Barley. Hulled barley is whole grain with only outer inedible husk removed. Pearl barley is a refined version. It is steamed and its hull and bran is removed. Hulled barley is more nutritious. Barley *daliya* is also available in market. We can prepare various dishes like *khichdi*, *pulav*, porridge from these varieties. Barley flour is also available in market which can be used to make *chapatis*. If the raw taste of barley doesn't appeal your taste buds then you can mix it with wheat in 1:1 proportion. In north India the hulled barley is roasted on low flame and then grounded to prepare *Jau ka sattv* which is highly nutritious. It is mostly consumed during summer to counter sun strokes. Ayurveda also advocates use of *sattu* for diabetics. In fact it's a best energy drink for diabetics. In Bihar and UP people prepare *Litti-chokha* from *sattu* which is a delicious dish.

In this way it is very much possible to incorporate barley in our daily diet so that we can keep diabetes at bay. ■



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Multi grains: Road to Wellness

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Know your grains

Grains are seeds of various wild species. They represent oldest crops that were adopted by human beings for cultivation. They constituted staple food prior to the development of high yielding varieties of major grains i.e. rice, wheat and corn, which are now cultivated and consumed all over the world. Different millets are still cultivated and consumed in different parts of the world, and are still staple food for 1/3rd population, especially in Africa, Europe and South East Asia and many of them are still unlisted. They are utilised in various ways and have gradually become a part of local food culture.

Dietary importance of grains

Grains are the mainstay of consumer's diet all over the world. Quantitatively, they constitute 60-70% of the diet - specially vegetarian diet - and contribute maximum energy in the form of carbohydrates, as well as major portion of proteins requirement to keep us going.

Cereals are seeds from family *Gramineae*, and include rice, wheat, corn, sorghum and *bajra*, *ragi* and many other millets. The seed has single cotyledon. Rice is most widely consumed cereal in the world, and is the main part of diet in coastal areas of India. Corn is widely cultivated for food and fodder purposes. Wheat is a unique cereal, which contains protein "gluten", and has the property to form elastic and extensible dough. It is widely used for preparation of bread biscuits and varieties of *rotis*, *sewai*, and pasta.

Legumes are seeds from family *Leguminosae*, and include *Tuar*, *channa*, *mung*, *urad*, as well as minor legumes like moth beans (*matki*), kidney beans (*Rajma*), cow pea (*chawali*), and other local varieties like *kadawe wal*.

Nutritional importance of grains

Cereals: They contain 60-65% starch that contributes to energy. They also contain protein (8-13%), but the proteins are not complete. If consumed with husk, they provide fiber, and also contribute B group vitamins, and minerals like iron, calcium, and magnesium.

When compared to widely consumed major cereals (rice, wheat and corn), millets are a better source of micronutrients like iron, calcium, magnesium, antioxidants and dietary fiber. Millets have low glycemic index and are considered suitable for diabetics and obesity.

Legumes: They contain 2-2.5 times more proteins, compared to cereals, but proteins in legumes are also incomplete proteins. Apart from proteins, they are good source of minerals and B group vitamins. Whole grains also contribute fiber. Soyabean belongs to the legume group but contains about 38-40% proteins and 19-20% oil.

Processing of grains

Grains need to be processed in various ways prior to consumption. These include dehulling, milling, flaking, puffing, malting, fermentation, extrusion etc. Removal of husk and germ of wheat leads to loss of major portion of minerals, vitamins and fiber, thus nutrient content is reduced. Puffing and flaking of grains give partially cooked ready to eat products. Puffed or flaked grains are easy to digest, are ready to eat (RTE), and are a healthy food anytime-anywhere.

Extrusion: Extruded products are prepared from dough prepared with the flour, which is extruded in the form of *sewai*, noodles, or pasta. These are dried for long term storage, and cooked in water prior to consumption.

High pressure extrusion: Grits or flours along with addition of salt, sugar, malt, etc., are mixed with suitable quantity of water and passed through high pressure extruder, at pressures ranging between 250-300 psig. On extrusion, they expand due to sudden evaporation of water and are further dried and lightly toasted to give crisp texture. They are costly due to the use of high technology and fancy packaging.

Germination: Grains are soaked in water for around 4-8 hours, drained and kept covered in moist place for about 12-16 hours. The enzymes are activated to digest starch and proteins in the endosperm, and initiate the growth of embryo. These germinated grains are consumed within 8-10 hours, as such or after cooking. Germinated grains are easily digested and are rich in micronutrients, specially vitamins, iron and calcium. Germination followed by roasting gives

nutritious malt that can be stored for a longer period.

Importance of multigrain diet, and supplementary action of grains

All grains do not possess all nutrients in the right proportion. Both cereals and legumes contain starch and proteins, vitamins and minerals, but in varied amounts, and none of them can satisfy all requirements individually.

Proteins are made up of twenty different amino acids, out of which ten amino acids are required to be supplied from the diet. Different grains contain unbalanced proportion of these amino acids, some being extra and some in short supply. Cereals are deficient in lysine, legumes contain greater proportion of lysine, but less of methionine. The result is that proteins present in either of them are not absorbed efficiently in body. Combination of different grains compensates the shortage of amino acid in one grain with amino acids from other grains, and improves protein quality.

Oilseeds like groundnut, coconut, gingelly (*til*) and linseed(*jawas*) are widely used ingredients in Indian cooking. They are excellent source of proteins, calcium and iron. **The suggested combination of grains, legumes and nuts is 60:30:10.**

Interestingly, most of the regional traditional menus are found to constitute such combinations. *Zunaka-Bhakari* and *chutney*, *Khichadi Papad* (Maharashtra) *Thepla*, *Khakara*(Gujrat) *Chholabhatura*, *Rajamachawal* (Punjab), *idli-sambar-chutney*(Tamil Nadu) *Bisibeli annam* (Karnataka), *Dal-bati*, *Missiroti* and *Gatte ki sag* (Rajasthan) and many more combinations can be quoted in support.

Millet:

Honourable Prime Minister declared 2018 as year for millets for India, and WHO is now promoting 2023 as the international year of millets.

Agronomically, in comparison to widely consumed major cereals (rice, wheat and corn), millets can be grown in any type of soil, require less inputs of water, fertilizers, pesticides etc. But the cultivation is localised, and the yield is low. Farmers face problems like lack of assured market, low shelf-life and non availability of proper processing machinery.

At the consumer level, the major issues for the replacement of major cereals by millets are:

- **Availability:** All millets are not available all over the country, because of localised cultivation. Processing facilities are not available everywhere, and grains are susceptible to insect infestation, and are wasted due to low shelf-life.
- **Affordability:** Being in great demand and short supply, the cost of millets in open market is 2.5-4

times that of common cereals like wheat and rice. Cost of millets ranges between 2-4 times compared to major cereals.

- **Acceptability:** Millet based recipes are out of circulation in most of the modern urban households and hence are not appreciated. In addition, prolonged cooking time restricts regular use of millets in place of wheat/rice.

Hence, a sustainable option is suggested as incorporation of millets in traditional foods in the form of *roti, paratha, upama, khichadi, suji* etc.

Promotion strategies for millet based foods:

Although millet cultivation is being promoted at central and state government level, millet consumption by common public needs to be promoted simultaneously. At individual level, this can be done by practicing frequent use of millets and multi-grains in daily food pattern, during breakfast, regular meals, and novel snacks.

Opportunities for Micro entrepreneurs: Hon'ble Prime minister's clarion call "Vocal for Local" and recently introduced Prime Ministers Micro Food Processing Scheme opens opportunities for rural womenfolk with skill and proficiency in preparing traditional millet based foods. Various traditional nutrition rich foods, which are on the verge of extinction, can be promoted for urban market. This includes multigrain and millet based snacks and confectionary like puffed millet laddus, ready to cook mixes for foods like *ambil* and *patawadi* (*Vidarbha*), *thepla*, *handua*(Gujarat), *missi roti*, *khichadi*, multipurpose multigrain flour mixes, and many more. Multigrain cookies are a healthy alternative for refined flour cookies, whereas multigrain sattu is a local ready to eat (RTE) flour that can be consumed in multiple ways. Multigrain cafe can be an interesting concept, promoted as restaurant, or as cloud kitchen.

At society level, awareness can be increased by organizing millet festivals, recipe competitions and cookery shows, revival of traditional healthy recipes through print and digital media, sponsoring millet based products, and introducing novel concepts for introducing traditional foods with a twist to suit modern palate and lifestyle.

Some tips:

- Include different grains in single meal
- Avoid fried foods, use pressure cooking, steaming or pan frying
- Include fresh uncooked items like salad, sprouts, pickles
- Include some form of milk/curd/ buttermilk/ paneer/ egg in daily diet. Children need more protein for growth. ■

Plant Based Milks: From Fields to Farm

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Plant-based or non-dairy milk alternative is the fastest-growing sector in the functional and speciality beverage across the globe. Traditional dairy milk, once considered a dietary staple for many, has faced criticism due to concerns about animal welfare, environmental impact, cow milk allergy, lactose intolerance, calorie concern, and rise in hypercholesterolemia cases. Further preference for vegan diets have swayed consumers to choose cow milk

alternatives for sustainable and healthy lifestyle. Plant-based milk substitutes are on a rising trend, and can serve as a means of inexpensive alternative for the poverty-stricken population in developing countries' and places where cow's milk supply is insufficient (Sethi *et al.*, 2016).

According to a report by Grand View Research, the global plant-based milk market size was valued at USD 13.3 billion in 2020 and is expected to grow at a compound annual growth rate (CAGR) of 10.4% from 2021 to 2028. According to a report by Mordor Intelligence, the Indian plant-based milk market was valued at USD 288.27 million in 2020 and is expected to grow at a CAGR of 8.18% from 2021 to 2026.

Plant-based milk alternatives are fluids that results from the breakdown (size reduction) of plant material (cereals, pseudo-cereals, legumes oilseeds, nuts). It is then extracted in water and further homogenization of such fluids results in particle size distribution in range of 5-20 μ m which mimics cow's milk in appearance and consistency. Plant-based milk is prepared by soaking plant ingredients, blending them with water, straining the mixture, and optionally adding sweeteners and flavours. Cow milk, on the other hand, is obtained from cows through milking, followed by pasteurization and packaging. The contrasting methods of preparation result in the distinct characteristics and flavours of plant milk and cow milk. Although, the definition and classification of these plant-based milk alternatives in literature is not stated, they can be categorised into five groups as follows:

- *Cereal based*: Oat milk, Rice milk, Corn milk, Spelt milk, Millet Milk, Rice Milk, etc.
- *Legume based*: Soy milk, Peanut milk, Lupin milk, Cowpea milk, etc.
- *Nut based*: Almond milk, Coconut milk, Hazelnut milk, Pistachio milk, Walnut milk, etc.
- *Seed based*: Sesame milk, Flaxseed milk, Hemp seed milk, Sunflower milk, etc.
- *Pseudo-cereal based*: Quinoa milk, Teff milk, Amaranth milk (Sethi *et al.*, 2016).

Plant-Based Milk Vs Cow Milk

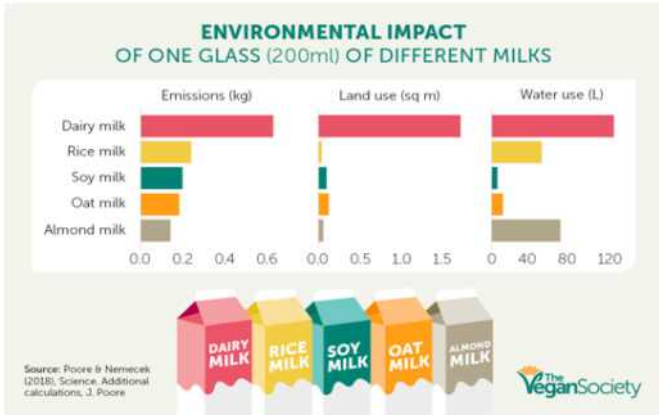
Parameters	Soy milk	Quinoa milk	Rice milk	Oat milk	Almond milk	Coconut milk	Multigrain milk	Cow's milk
Brand	Silk	Ecomil	Pacific	Oatly	Silk	Silk	Pacific organic 7 grain	Amul Gold
Calories (g)	80	104	130	80	40	80	140	168
Protein (g)	7	4.5	1	2.5	1	<1	3	8
Fat (g)	4	6	2	4	3	5	2	10
Carbohydrates (g)	4	9	27	16	2	7	27	11
Dietary fibres (g)	1	–	0	2	1	0	1	–
Calcium (% daily value)	30	–	30	15	20	45	35	338 mg
Iron (% daily value)	–	–	6	0	2	4	8	1.25 µg
Vitamin A (% daily value)	10	–	10	10	10	10	15	168 µg
Price Per Litre	₹110 - ₹130	₹150 - ₹180	₹110 - ₹130	₹150 - ₹180	₹110 - ₹130	₹90 - ₹110	₹150 - ₹180	₹50 - ₹60
Consumption Rate (per capita, India)	3.50%	N/A (less common)	1.20%	1.80%	2.50%	1.20%	N/A (less common)	91.80%

Oat Milk: The Rising Star

Oat milk has recently grown in demand owing to its possible remedial benefits. Due to the presence of dietary fibres, phyto chemicals and high nutritional value, oats have entered expansive interest. Made from a blend of oats and water, oat milk has gained popularity among individuals seeking dairy-free, nut-free and vegan options, as well as those with lactose intolerance or allergies. Oat milk is more sustainable than animal milk due to several factors. It has a lower carbon



footprint, requires less water and land for cultivation, promotes animal welfare, is resource-efficient, reduces waste, and contributes to a long-term sustainable food system.



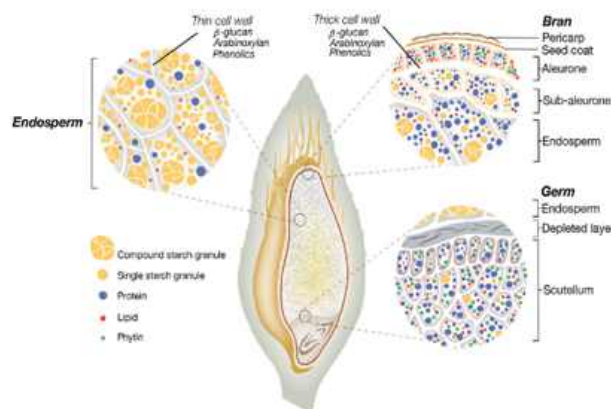
Furthermore, Oat beta glucan is a unique soluble fibre found in oats that sets it apart from other types of fibres

as it contributes to numerous health benefits, such as providing essential nutrients, supporting heart health, aiding digestion, and promoting overall well-being. Let's explore these in detail:

1. **Cardiovascular Diseases:** Oats can help reduce serum total cholesterol and LDL cholesterol levels, thereby reducing the risk of cardiovascular diseases. The beta-glucan in oats forms a viscous layer in the small intestine, inhibiting the uptake of cholesterol and increasing the excretion of bile acids.
2. **Type II Diabetes:** Oats have the potential to reduce postprandial glucose levels. Consuming oats with high beta-glucan content can help regulate insulin metabolism and lower blood glucose levels.
3. **Obesity:** Oats contribute to weight loss due to their high dietary fibre content, which provides a feeling of satiety and reduces hunger. The viscosity of beta-glucan in oats delays gastric emptying, inhibiting food intake and reducing overall body weight and body fat.
4. **Cancer:** Oats contain biologically active compounds that have shown potential in reducing the risk of certain cancers, such as skin cancer, lung cancer, and colon carcinoma. Avenanthramides and avenacosides found in oats have demonstrated anti-tumour and chemo preventive properties.
5. **Gut Microbiota:** Oats can positively influence gut health by promoting the growth of beneficial gut bacteria. The beta-glucan and resistant starch in oats help modulate gut microbiota, improve gastrointestinal health, and prevent diseases like obesity, diabetes, and colorectal cancer.

In oat milk production, the endosperm is broken down into simple sugars, which add flavour and directly impact the product's texture. For oat milk production, the endosperm is the essential part of the seed. The bran is high in fibre and rich in protein. Oats are more absorbent than nuts and allow some oat solids to pass through the filter process. These solids give oat milk its natural sweet flavour, creamy texture without the need for additional ingredients, giving it a smooth, rich mouth feel. The neutral flavour of oat milk makes it ideal for adding creaminess without adding flavour and its versatility allows for various uses in a wide range of culinary applications such as coffee, tea, smoothies, shakes, pancakes, waffles, curries, soups, chocolates, desserts and baked goods such as muffin, cakes, breads, and cookies.

Structural representation of the oat grain presenting different oat tissues (Grundy et al., 2018)



In conclusion, oat milk has rightfully earned its place as a leading plant-based milk alternative. Its creamy texture, pleasant taste, and wide range of uses make it a versatile ingredient in both sweet and savoury dishes. Oat milk is available in affordable pricing as oats are readily available. The production process of oat milk is resource-efficient, resulting in lower production costs. Additionally, the increasing demand for oat milk has led to economies of scale, enabling manufacturers to offer it at a more cost-effective price point. Not only does oat milk offer a delicious dairy-free option, but it also provides essential nutrients and aligns with sustainable, cost efficient and eco-conscious values.

References:

1. Grand View Research. (2021). Plant-based Milk Market Size, Share & Trends Analysis Report by Product (Soy, Almond, Coconut, Rice, Oats), By Distribution Channel (Supermarkets & Hypermarkets, Convenience Stores), By Region, And Segment Forecasts, 2021 - 2028. <https://www.grandviewresearch.com/industry-analysis/plant-based-milk-market>
2. Grundy, M. M. L., Fardet, A., Tosh, S. M., Rich, G. T., & Wilde, P. J. (2018). Processing of oat: the impact on oat's cholesterol lowering effect. *Food & function*, 9(3), 1328-1343.
3. Mordor Intelligence. (2021). India Plant-Based Milk Market - Growth, Trends, COVID-19 Impact, and Forecasts (2021 - 2026) . <https://www.mordorintelligence.com/industry-reports/india-plant-based-milk-market>
4. Sethi, S., Tyagi, S. K., & Anurag, R. K. (2016). Plant-based milk alternatives an emerging segment of functional beverages: a review. *Journal of food science and technology*, 53(9), 3408-3423.

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Grain & Pulses Processing Technology

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Humans have recognised the importance of grains and pulses during and post pandemic times. Initially they used to consume them in the unprocessed forms. Subsequently it was found that unprocessed grains and cereals were difficult to digest hence the processing technologies came into existence.

Home flour mill is a fun, easy and fast way to turn whole grains into flour that is easily digested and assimilated by the body. Many will be benefited from the nutrients present in the whole foods (free from additives), but not all due to the constitutional differences. Fresh produce tastes so much better and nothing is fresher than the flour obtained from grain grinder minutes before becoming the best-tasting breads, cakes and cereals one has ever made.

Flour mill have been used for wheat grinding, oat flakers, both hand operated and electric, are common. White rice and brown rice are examples of refined grains. Refined grains are sometimes called refined carbs or refined carbohydrates. These grains have been processed. The refining process removes the bran and germ. The refinement process also gives these foods a finer texture and prolongs their shelf life.

The by-products of the processed grains are the result of producing corn, distilling, manufacturing food for human consumption like flour, corn meal, etc. and what is left over during the milling process are wheat middlings, rye middlings, soy bean oil, etc.

Agricultural processing works on the processing of food in general and on the marketing of processed food products in particular. The corn refining process is more than 150 years old. The process of separating corn into its component parts must be perfect to create a myriad of value added products. The corn wet-milling process separates corn into its four basic components: starch, germ, fibre and protein.

The comprehensive range of flour mills are: Flour Mill Machine, Vertical Stone Flour Mill, Portable Flour Mill Machine, 2 in 1 Flour Mill and Table Top Flour Mill. These are designed with utmost precision and are highly getting accepted among the customers for their remarkable attributes. With the incorporation of advanced techniques one can cope up with the challenges of the industry.

Manufacturers of the best quality *Besan Plant, Atta Chakki Plant, Industrial Grinding Machine, Flour Mill Machine, Impact Pulveriser* are also available in the market now a days.

Grain flow scale is a fast quantitative packaging unit that integrates filling measurement, sealing packaging and transportation. The grain flow scale has the characteristics of reasonable structure, beautiful appearance, stable operation, energy and power saving, convenient operation and accurate weighing.

Rice milling machine:

This rice milling machine is a comprehensive equipment for rice processing. The rice goes into machine through vibrating screen and magnetic unit, then goes forward under the rubber-roller for hulling. Winnowing or air-blowing is performed to remove the husk.

Machines needed for rice processing equipment:

1. Rice Mill Vibrating Cleaning Sieve and De-stoner. The reciprocating separator is suitable for cleaning raw grain for the grain processing plant and grain storage. Rice husker is used for hulling rice husk and to separate rice husk from the mixture of paddy and brown rice.
2. Gravity Paddy Separator.

Use of rice milling machine:

- One can control the speed of rice to enter the machine
- It can mill and crush rice with high working efficiency
- The milled rice and rice husk can be discharged from different outlets and the milled rice is very clean
- The crushed rice husk can be used to feed animals which is a good way to get feed.

Rice milling process:

Rice milling is the process of removing the husk and bran layer to produce white rice. Rice milling can be undertaken as one step milling process where the husk and the bran are removed in one pass and white rice is produced directly from the paddy.

TECHNICAL ARTICLE

Grain-Cleaner is ideal for removing dust, “bee-wings” and so on.

A **rice huller** or **rice husker** is used to automate the process of removing the outer cover of grains. Throughout history, there have been numerous techniques to hull rice. Traditionally, it would be pounded using some form of **mortar & pestle**. An early simple machine to do this is a **rice pounder**. Later even more efficient machinery was developed to hull and polish rice. These machines are most widely developed and used throughout **Asia** where the most popular type is the **Engelberg huller** designed by **German Brazilian** engineer, **Evaristo Conrado Engelberg** in Brazil and first patented in 1885.

The Engelberg huller uses steel rollers to remove the husk. Other types of huller include the disk or *cono* huller which uses an abrasive rotating disk to first remove the husk before passing the grain to conical rollers which **has to polish** it to make white rice. This is done repeatedly since other sides of circular side of rice are not

husked. Rubber rollers may be used to reduce the amount of breakage of the grains, so increasing the yield of the best quality *head rice*, but the rubber rollers tend to require frequent replacement which can be a significant drawback.

Cereal products derived from the milling process include wheat, rye, oat flours, cornmeal, corn grits and semolina. Flour from cereals is used for making bread. Other products are breakfast cereals, pasta, snack foods, dry mixes, cakes, pastries, and tortillas.

Cereal processing is one of the oldest and most important of all food technologies. It is designed for all those involved in cereals processing whether raw material producers and refiners needing to match the needs of secondary processors manufacturing the final product for the consumer, or secondary processors benchmarking their operations against best practice in their sector and across cereals processing as a whole. Thus there are many upgraded versions in Grain and Cereal Processing technologies these days. ■



Fraud in Grains and Pulses: Poison in Disguise

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Purnabrahma



Sometimes, there is more than what meets the eye! Just by reading the list of ingredients or the nutrition facts label on the food packaging may not tell the real story.

Food fraud, also termed as economically motivated adulteration (EMA) of food, can be generally ascribed to a disagreement between the statement made on the food packaging label (about food products, ingredients, packaging) and its contents.

A great deal of the global population's calories are fulfilled by grains and cereals. These are enormously important to many countries' economies. Fraud in grains and pulses is a major problem that can lead to serious consequences for both consumers and the global food supply chain. When the food is free of any contaminants, meets all the nutritional requirements, and has reliable labeling, then it is considered safe. The Food Safety and Standards Association of India (FSSAI) is the body responsible for protecting and promoting consumer health through regulation and supervision of food safety by formulating scientific standards and implementing them through analysis of food and market surveillance.

There are different types of food fraud, which include, but are not limited to the following:

1. Varietal or species substitution: This is when one type of grain or pulse is substituted for another,

often of a lower quality or price. For example, wheat may be substituted for barley, or lentils may be substituted for peas. Another example is when one type of rice is substituted for another, often of a lower quality or price.

2. Organic fraud: This is when food is deceptively labeled as organic, when it is not. Organic food is grown and processed without the use of synthetic pesticides, herbicides, or fertilizers.

3. Genetically modified organism (GMO) adulteration: This is when GMO grains or pulses are mixed with non-GMO ones. GMOs are considered one of the main food adulteration technologies and illegal additives that involves introducing foreign genes from animals, bacteria, viruses, or other plant species into crops.

4. Tampering: This is when the legitimate food products and packaging are mishandled with sole intentions of financial gain. It generally includes altering the expiry date information on the label or addition of toxic chemicals for freshness.

5. Adulteration: This is when the grains are mixed with other materials, such as sand, stones, or other grains. Adulterated grains or pulses may have a different color, texture, or smell than the genuine product. One example is mixing of gluten-containing cereals with non-gluten products can pose a potential threat to celiac individuals. In India, wheat is adulterated with ergot, which is detrimental to health. Another example is adulteration of *arhar dal* with Metanil yellow. Metanil yellow is a non-permitted food colour used extensively in India. Its long-term consumption can cause neurotoxicity on the developing and adult brain.

6. Melamine adulteration: This is a serious type of fraud that can be fatal. Melamine is a toxic chemical that is sometimes used to artificially increase the protein content of food. When melamine is ingested, it can cause kidney failure and death. eg: Milk

7. Mislabelling: This is when the grain is labelled with false information, such as the country of origin or the variety of the grain concerned.

8. Misbranding: This is when the grain is purposefully branded in a deceptive way

9. Counterfeiting: This is when the original food product is manufactured with the motive of imitating the appearance and general characteristics of another legitimate food. Generally same names are given so that the customers can be deceived, but they do not really “imitate” the original legitimate food, both in appearance and general features.

Impacts of the Russia-Ukraine War on Global Grain Food Fraud/ Food Security:

It has been over a year now, as the conflict between two major agricultural powers Russia-Ukraine has worsened, its implications on food security and socioeconomic impacts have been strongly felt. The war immediately affected grain (mainly maize and wheat) shipments from Ukraine, exodus have caused labour shortages, access to fertilizers have become restricted, and future harvests have become uncertain. The war has delayed spring planting, winter crop harvesting and severely affected staple supplies and pricing.

Regarding cereals, the contribution of Russia and Ukraine to the global supply is notably substantial for barley, wheat, and maize. In 2021, Russia and Ukraine were among the top three global wheat and maize exporters. Likewise, due to economic sanctions placed on Russia, there is a great deal of uncertainty about Russian export prospects in the future. The war is expected to harm agricultural operations in Ukraine, prohibiting farmers from attending to their fields, and harvesting and selling their products.

Wheat occupies a central place in human nutrition. It is an essential food for more than 35% of the world's population, providing 20% of the daily protein and food calories. In North Africa and West Asia, wheat provides about 40–43% of the daily calories and proteins. The present war has resulted in zero harvest of wheat and consequently a sharp drop in wheat exports from Russia and Ukraine. To increase protein levels of milling wheat, we may see adulteration with high protein flour (legume or lupin for instance) and potential unexpected allergens. As the demand outstrips supply, lower quality grains will be entering

human food chain.

The impacts on the maize market depend mainly on Ukraine since Russia is a small producer. Ukraine is the world's fourth-largest maize exporter, accounting for around 15% of the global market. It is a fertilizer hungry crop so even if it's planted, without the fertilizer supply, the yield will be severely reduced. The war has prevented sowing, and with the world corn market already very tight, will not be able to compensate for the lack of deliveries from Ukraine. As a result of this, lower quality grains will be entering the food market.

This war has resulted in immediate and far-reaching cascading consequences on global food security, increasing the likelihood of food fraud in cereals and grains (including others) manifold.

Food Fraud Status in India:

The food fraud problem in India has become rampant with about ten states unable to guarantee food safety. About 15% of food samples fail to meet the quality test standards due to deficit labour and inadequate food testing laboratories. In India, food adulteration is mostly seen in milk, tea/coffee, wheat, vegetables, honey, sweets, vegetable oil, pulses, ghee, cumin seeds, spices, butter, illegally produced liquor, and ice-cream.

The fake food trade is booming and food forgers are making a profit of 200 % through illegal trade as the cost of production is cheap. Over Rs. 1 lakh crore is lost annually by our country due to the sale/purchase of counterfeit goods by consumers across all sectors. Counterfeiting corrupts an economy by infringing consumer rights and brand equity by causing losses to industries and government revenues.

In spite of some recommendations made, the government has abstained itself from taking stringent actions. Thus, amending food adulteration laws is the absolute necessity.

Fraud in grains and pulses can have a number of negative consequences, including:

- **Economic losses:** When consumers are cheated out of money by purchasing adulterated food, this can lead to economic losses for farmers, businesses, and governments.

- **Health problems:** Consuming adulterated food can lead to a variety of health problems, including food poisoning, allergies, and even death.
- **Damage to the reputation of the food industry:** When fraud is discovered, it can damage the reputation of the entire food industry. This can make it more difficult for farmers and shopkeepers to sell their products, and it can make consumers less likely to trust the food they eat.

Mitigating Food Fraud:

A good way of mitigating food fraud is a combination of organizational and testing measures. Organizational measures include, but are not limited to, clear specifications, fraud-specific audits, and monitoring of the market. Testing measures include several analytical tools that have been evaluated for grain quality control, such as various spectroscopic techniques (Laser Induced Breakdown Spectroscopy, Vibrational Spectroscopy), mass spectrometry (Inductively Coupled Plasma-Mass Spectrometry), immunosorbent assays, analyte separation techniques (Gas and Liquid chromatography), DNA based methods, or combinations thereof.

Some of the ways to prevent fraud in grains and pulses include:

- **Increased government regulation:** Governments can play a role in preventing fraud by conducting inspections and enforcing stringent laws against fraud.
- **Industry self-regulation:** The food industry can develop its own standards and practices to prevent fraud.
- **Consumer education:** Consumers can be educated about the risks of fraud and how to identify adulterated food.

Consumer awareness about fraud in grains and pulses is important because it can help to prevent people from being cheated out of money, from consuming adulterated food and protecting themselves and their families. The consumers can adopt the following ways to become more aware about fraud in grains and pulses:

- **Read food labels carefully:** When you are buying grains or pulses, be sure to read the food label carefully. The label should list the ingredients, the country of origin, and the expiration date.
- **Be suspicious of low prices:** If you see a grain or pulse that is priced significantly lower than other similar products, be suspicious. It is possible that the product is adulterated or of lower quality.
- **Buy from reputable sources:** When you are buying grains or pulses, buy from reputable sources. This means buying from stores that you trust and from brands that you are familiar with.
- **Report suspected fraud:** If you suspect that you have purchased adulterated grains or pulses, report it to the authorities. This will help to ensure that the fraud is investigated and that other consumers are not harmed.
- **Look for signs of tampering:** If the packaging is damaged or if the product does not look or smell right, it may be adulterated.
- **Check the expiration date:** Do not buy grains or pulses that are expired.
- **Store grains and pulses properly:** Grains and pulses should be stored in a cool, dry place.

Conclusion:

Fraud in grains and pulses is a serious problem, but it is one that can be prevented. The industries must practice analytical testing, adopt relevant technologies (authentication and traceability solutions) and combine these with preventative risk mitigation plans that are based on known susceptibilities to fraud, so that quality grain products can make it from the farm to the hands of consumers. The government and brand owners should communicate to the consumers about authentication features on their products and verify them. Moreover, there is a pressing need for a strict legislative and regulation system with an aim to protect public health. Consumer awareness and participation is central to combatting food fraud to a greater extent. Thus, by working together, governments, consumers, and the food industry can help to ensure that the food we eat is safe and of high quality. ■



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- b. Coffee Extracts

Herbal Extract

- a. Shatawari
- b. Ashwagandha
- c. Giloy

AARKAA Special Extracts

- a. TenduPatta
- b. BhootJolokia / Ghost Chilly
- c. Lakdang Turmeric
- d. Large Cardamom

Functional / Nutraceutical Extract

- a. Flakes Seeds
- b. Betel Leaves
- c. Areca Nut
- d. Black Rice
- e. Black Carrot
- f. Catechu



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Analytical Tools for the Detection of Adulterants in Grains, Cereals and Pulses

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Food adulteration and fraud have been ongoing issues throughout history, with the potential for serious public health risks and financial gain. It involves the deliberate addition of inferior or harmful substances to food products, compromising their quality and safety. Food authentication is crucial for ensuring safety, quality, and consumer protection, as well as compliance with regulations and standards. Shockingly, studies have revealed that a significant portion of food available in the market is adulterated in some form. These adulterants can range from synthetic colorants and artificial sweeteners to pesticide residues and even dangerous substances like antibiotics. According to recent studies, an alarming number of food products are adulterated, with estimates suggesting that up to 10% of the global food supply is affected by various forms of adulteration. The extent of adulteration varies across different regions and food categories, but the impact on consumer health and safety cannot be understated.

Rice is one of the cereals which is highly vulnerable to adulteration. Rice is a staple cereal for more than half of the world's population, making it a target for fraud due to its widespread consumption. To combat rice fraud, researchers are exploring a range of techniques for authenticity testing. Mass spectrometry (MS) is an advanced technique increasingly used for untargeted analysis, providing insights into complex matrices containing numerous compounds. Spectroscopic techniques offer rapid and cost-effective screening

capabilities, although they may not identify specific markers. DNA assays are valuable for identifying the botanical origin of rice species but may not detect adulteration or geographical indication.

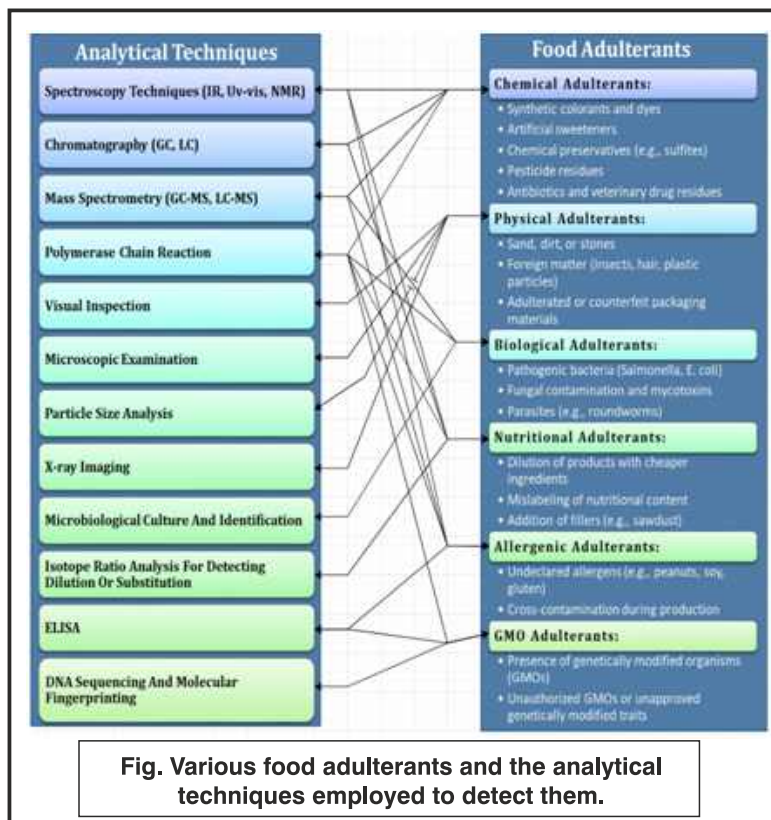
No single analytical tool can address all rice authentication challenges, therefore, a combination of approaches is necessary to profile and identify potential markers or adulterants. Recent advancements in statistical data examination methods have improved the classification of samples, enhancing the reliability and accuracy of authenticity analysis. Despite ongoing research and progress, the detection and prevention of rice fraud remain ongoing challenges for the industry. In addition to this there are several different types of adulterants in rice or other food products such as chemical, physical, biological, nutritional, allergens adulterants etc.

Chemical adulterants such as synthetic colorants, used to enhance food's appearance, are adulterated in approximately 30% of tested samples. Pesticide residues present another significant adulteration risk. Studies indicate that nearly 40% of fruits and vegetables on the market contain pesticide residues exceeding safety limits.

The most common analytical techniques used for qualitative and quantitative analysis of food adulterants are spectroscopic (IR, Raman, NMR), Chromatography with mass detector, and PCR. Physical adulteration, involving foreign matter or contaminants, is also prevalent in rice and other food products. In one study, nearly 15% of food samples were contaminated with objects like insects, hair, and plastic particles. These contaminants compromise food quality and pose potential health risks to unsuspecting consumers. Microscopic analysis and particle size analysis are instrumental in identifying sand, dirt, or unwanted substances. Advanced X-ray imaging technology helps detect adulterated packaging materials, preserving the integrity of food products. Nutritional adulteration, involving dilution and misleading nutritional labeling, can compromise consumer well-being. Techniques like High-Performance Liquid Chromatography (HPLC) and Ultra-High-Performance Liquid Chromatography (UHPLC) aid in nutrient profiling and accurate labeling. DNA-based authentication through PCR identifies and quantifies species, preventing the addition of fillers or substitution of high-value

ingredients. Unapproved genetically modified organisms (GMOs) in food products present another area of concern. PCR-based techniques provide sensitive and specific detection of GMOs, ensuring transparency and consumer protection. DNA sequencing and protein-based immunoassays, such as ELISA, contribute to accurate GMO detection.

As analytical techniques continue to advance, they will play an increasingly refined role in detecting food adulteration, protecting public health, and preserving the integrity of our food supply. The future holds promise with the development of innovative technologies and collaborations between scientists, regulatory bodies, and food manufacturers. Together, we can establish a robust food safety ecosystem that prioritizes consumer well-being and fosters an unwavering trust in the food industry. ■



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Ancient Grains: Exploring the Nutritional Powerhouses

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Introduction:

In recent years, there has been a resurgence of interest in ancient grains. These grains, which are sometimes acclaimed as "nutritional powerhouses," have been used for millennia and have a big role in the food habits of many different civilizations. Ancient grains are becoming more popular because of increased interest in healthy foods, a variety of culinary experiences, and a desire to rekindle our connection to our ancestors. Ancient grains offer an appealing substitute for refined grains as customers' awareness of the source and nutritional content of their food grows. Food scientists, food technologists, home cooks, and health lovers who want to infuse their food with the essence of traditional food have taken notice of their distinctive flavours, textures, and health advantages.

As their name suggests, ancient grains are the ones that have been grown for a very long time. In numerous parts of the world, they have supported civilizations, fed populations, and have been an essential part of traditional diets. Ancient grains, as opposed to contemporary hybridized types, have maintained their original genetic make-up, preserving the true flavors and nutritional value that have withstood the test of time. Ancient grains with a variety of tastes, textures, and nutritional profiles include sorghum, amaranth, millet, farro, barley, and oats.

In this article, we will delve into the characteristics,

health benefits, and culinary uses of these ancient grains, highlighting their unique qualities and why they deserve a place in a balanced and wholesome diet.

1. **Amaranth:** Amaranth is a grain-like seed that was a staple food of the ancient Aztecs and Incas. It is rich in protein, fiber, and essential amino acids, including lysine, which is typically low in other



grains. Amaranth is also a good source of iron, calcium, and magnesium. It can be cooked as a porridge, added to salads, or used as a flour substitute in baking.

2. **Millet:** Millet is one of the oldest cultivated grains in the world and has been consumed for thousands of years. This small, round



grain is gluten-free and provides a good source of dietary fiber, B-vitamins, and minerals like magnesium and phosphorus. Millet has a mild, slightly sweet flavor and a light, fluffy texture when cooked. It can be used as a base for pilaf, added to soups and stews, or ground into flour for baking. There are several varieties of millet, including pearl millet, foxtail millet, finger millet, proso millet, and barnyard millet. Each variety has its own unique characteristics and uses. Millets are typically gluten-free and have a low glycemic index, making them suitable for people with dietary restrictions or those seeking healthier food alternatives.

- 2.1 **Sorghum:** African-born ancient grain sorghum is currently grown all over the world. It is a useful grain that is available in a variety of colours, such as white, red, and brown. Sorghum is gluten-free

millet, making it ideal for anyone with celiac disease or gluten allergies. It is an excellent source of antioxidants, dietary fibre, and important

minerals including iron and phosphorus. Sorghum can be cooked as a whole grain, popped like popcorn, made into flour for baking, or even brewed into a cool beverage.



3. **Farro:** Farro, commonly referred to as *emmer wheat*, is a long-forgotten grain with a chewy texture and nutty flavour. It is a good source of fibre, iron, and other vital elements like the B vitamins and protein. Mediterranean food frequently incorporates farro into salads, soups, and risottos. Additionally, it can be prepared and eaten as a side dish or added to grain-based bowls for a filling and healthy dinner.



4. **Barley:** One of the earliest grains to be cultivated, barley has long been a mainstay of many



different cultures. It is a good source of vitamins, minerals, and dietary fibre, as well as selenium and manganese.

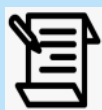


Barley can be utilised in a variety of ways, including as barley flour, pearl barley, or hulled barley. It frequently adds a nutty flavour and a delightful chewiness to soups, stews, and salads.

5. **Oats:** The nutritional advantages of oats have been well known for thousands of years. They are an excellent source of soluble fibre, which can assist in reducing cholesterol and fostering heart health. Complex carbohydrates, protein, and important minerals like manganese and phosphorus are also included in oats. Oats are flexible grains that can be included into a variety of foods, including oatmeal, baking, smoothies, and granola bars. They also provide a filling and nutrient-dense complement to any diet.

Nutritional Significance:

Ancient grains are essential contributions to a balanced diet due to their nutritious composition. Proteins, fibre, vitamins, and minerals are among the vital nutrients they offer, all of which support general health and wellbeing. Table 1 shows the nutrient composition of many ancient grains. These grains can be added to meals to provide a range of flavors, textures, and nutritional advantages, making them a healthy option for many different recipes.



DECLARATION



- The contents of this issue is referred and compiled from various sources and Purnabrahma doesn't claim it's authenticity.
- The contents given in the article are the views of the respective authors.

Table 1. Nutrient Composition of ancient grains

Grains	Calories (per 100g)	Protein (g)	Fiber (g)	Carbo-hydrates (g)	Fat (g)	Vitamins	Minerals
Amaranth	371	14.1	6.7	65.3	7.0	Vitamin C, E, B	Calcium, iron, magnesium, phosphorus
Millet	378	11.0	8.5	72.8	4.2	B-vitamins (niacin, thiamine)	Magnesium, phosphorus, manganese, zinc
Sorghum	329	11.3	6.3	72.1	3.3	B-vitamins (thiamine, niacin)	Magnesium, iron, phosphorous, potassium
Farro	329	14.0	8.5	72.8	4.2	B-vitamins (niacin, thiamine)	Iron, magnesium, zinc, phosphorus
Barley	354	12.5	17.3	73.5	2.3	B-vitamins (niacin, thiamine)	Selenium, phosphorus, copper, manganese
Oats	389	16.9	10.6	66.3	6.9	B-vitamins (thiamine, folate)	Magnesium, phosphorus, zinc, manganese

Application and Health Benefits:

These ancient grains can be used to make a range of foods and have several health advantages. Here are a few of these grains' main benefits and food applications:

1. Nutritional Powerhouses: In comparison to today's refined grains, ancient grains are frequently higher in nutrients. They include a lot of dietary fibre, which promotes good weight management and aids with digestion. They also include a variety of important vitamins, minerals, and antioxidants that support general health.
2. Gluten-Free Alternatives: Many ancient grains, such as sorghum, amaranth, and millet, are naturally gluten-free, making them great choices for people who have celiac disease or gluten allergies. They make it possible for

people who follow a gluten-free diet to eat a variety of delectable and nourishing grain-based foods.

3. Diverse Food Applications: Ancient grains can be used in a variety of culinary dishes. In addition to being cooked as whole grains, they can be used in soups, stews, salads, and pilafs as well as processed into flour for baking. Their unique tastes and textures provide a variety of food depth and complexity.
4. Sustained Energy Release: Complex carbohydrates found in ancient grains give enduring energy all day. They are a great option for preserving constant energy levels because their fibre content regulates blood sugar levels and prevents unexpected spikes and crashes.

5. Versatile and Flavourful: Every old grain has an own flavour characteristic that might range from nutty to slightly sweet. Due to the interesting culinary research and food development made possible by this diversity, a wonderful eating experience is guaranteed.

Conclusion:

The resurrection of ancient grains like sorghum, amaranth, millet, farro, barley, and others has captured the interest of health-conscious people, food technologists, food scientists, and industry professionals alike. These grains, which were formerly regarded as traditional or forgotten, have restored their

standing as dietary powerhouses and adaptable nutrients. In contrast to their more widely consumed relatives, ancient grains provide several advantages. They often undergo less processing and retain their original vitamins, minerals, fibre, and protein. Their distinctive nutritional compositions help promote digestive health, maintain energy levels, and lower the chance of developing chronic illnesses. Ancient grains also broaden our culinary horizons and add variety to our diets. They provide a wide variety of tastes, textures, and cooking options. The diversity of ancient grains is unsurpassed and includes substantial whole grain salads, cosy porridges, gluten-free baking, and healthy side dishes. ■



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